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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,846	09/23/2003	Graham Smith	GP30201V	4957

7590 02/23/2007

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EXAMINER	
LOCKARD, JON MCCLELLAND	
ART UNIT	PAPER NUMBER
1647	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/668,846	SMITH ET AL.	
	Examiner	Art Unit	
	Jon M. Lockard	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) *1,2 and 5-8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3 and 4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-8* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/523,860.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/31/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, claims 3-4 drawn to polypeptides in the reply filed on 30 November 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 1, 2, and 5-8 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 30 November 2006.

Status of Application, Amendments, And/Or Claims

3. The Response to the Restriction Requirement filed on 30 November 2006 has been entered in full. Claims 1, 2, and 5-8 have been withdrawn from further consideration as discussed above. Therefore, claims 1-8 are pending and claims 3-4 are the subject of this Office Action.

Information Disclosure Statement

4. The Information Disclosure Statement (IDS) submitted on 31 August 2004 has been considered by the Examiner.

Sequence Rules

5. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, the application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reasons set forth below. This application discloses nucleotide sequences without the accompanying SEQ ID NOs (See pg 23, lines 9-11). Correction is required.

Specification

6. The disclosure is objected to because of the following informalities:

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "VANILREP4 POLYPEPTIDES".

8. The disclosure is objected to because it contains embedded hyperlinks and/or other form of browser-executable code. See for example, pg 11, line 28 and pg 20, line 18. Applicant is required to delete the embedded hyperlinks and/or other form of browser-executable code. See MPEP § 608.01. Appropriate correction is suggested.

9. The disclosure is objected to because of the following informalities: typographical errors "ce" (See pg 2, line 27); "with with" (See pg 5, line 10); and "SEQ ID NO4Accordingly" (See pg 5, line 35). Appropriate correction is suggested.

Claim Rejections - 35 USC § 101 and 35 USC §112

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
>
> The following is a quotation of the first paragraph of 35 U.S.C. 112:
>
> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 3 and 4 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility. Novel biological molecules lack an established utility and must undergo extensive experimentation to determine an appropriate specific, substantial, and credible utility.

12. The instant application discloses an isolated VANILREP4 polypeptide with an amino acid sequence set forth as SEQ ID NO:2. The specification asserts that the VANILREP4 polypeptides of the instant invention are believed to be members of the ion channel family of polypeptides, having homology and/or structural similarity with the rat vanilloid receptor VR1 (See pg 2, lines 23-25; pg 5, lines 9-11). The Specification discloses that the expression of VR-4 mRNA was highest in kidney, and generally higher in many peripheral tissues (e.g., liver, pancreas, placenta, and prostate) than in the CNS, where the highest levels were observed in the corpus callosum, hippocampus, spinal cord, and pituitary gland (See Example 1, pg 23 lines 1-24). Moreover, Example 2 of the Specification also discloses that HEK293 cells transiently expressing hVR4 were activated by PMA (12-myristate 13-acetate) and 4αPDD (4α-phorbol-

12,13-didecanoate) (See pg 23-24). However, the instant specification does not teach any expression data or functional characteristics of the VANILREP4 polypeptide set forth in SEQ ID NO:2 or the claimed nucleic acid set forth in SEQ ID NO:1 that encodes the protein. There is no well-established utility for a specific VANILREP4 nucleic acid or amino acid sequence, and the specification fails to disclose a specific and substantial utility for the claimed invention. The instant application does not disclose a specific biological role for the claimed VANILREP4 protein or the nucleic acid that encodes it, or its significance to a particular disease, disorder, or physiological process which one would manipulate for a desired physiological or clinical effect. The instant specification fails to provide any experimental data or information on whether the claimed putative VANILREP4 protein (SEQ ID NO:2) functions like a vanilloid receptor ion channel. Finally, assuming arguendo, VANILREP4 showed a pattern of expression similar to VR-4, mere homology and expression pattern is not accepted by those of skill in the art as being predictive of function. There is no well-established utility for a specific nucleic acid or amino acid sequence, and the specification fails to disclose a specific and substantial utility for the claimed invention. There are no working examples.

13. Based on the fact that the VANILREP4 polypeptide has homology and/or structural similarity with the rat vanilloid receptor VR1, the specification asserts the following as patentable utilities for the claimed VANILREP4 protein of SEQ ID NO:2:

1) treatment of various diseases (pg 1, line 33 through pg 2, line 1);

2) identification of agonists/antagonists (pg pg 2, lines 2-3; pg 13, line 29 through pg 14, line 19);

3) diagnostic assays for various diseases (pg 2, lines 5-6; pg 10, lines 17-25); and

4) production of antibodies (pg 12, lines 18-25).

14. These asserted utilities are neither specific nor substantial because they do not identify or reasonably confirm a "real world" context of use. The specification neither identifies the biological functions of the claimed protein or the DNA that encodes it, nor any diseases that are associated with the claimed molecules. Without any biological activity or link to a disease, further research would be required to determine the properties of the claimed VANILREP4 of SEQ ID NO:2 or to identify a disease that can be treated or diagnosed with the claimed molecules, which is insufficient to meet the requirement of 35 USC § 101.

15. These activities and functions are conjectural and are based solely on the identification of the putative protein of SEQ ID NO:2 as being a vanilloid receptor ion channel. While it is credible that SEQ ID NO:2 is a member of the vanilloid receptor family of ion channels, its identification as such is not sufficient to establish either a well known, or a specific and substantial utility. The putative protein encoded by SEQ ID NO:2 has never been assayed for functional activity, and no disease or disorder is correlated with either the nucleic acid or the encoded polypeptide. The use of a putative vanilloid receptor ion channel to discover its biological properties does not constitute a specific, substantial utility.

16. The art teaches that members of the vanilloid receptor family are activated by a diverse range of stimuli, including heat, protons, lipids, phorbols, phosphorylation, changes in extracellular osmolarity and/or pressure, and depletion of Ca^{2+} stores, and that understanding how these proteins are assembled, activated, and regulated is a prerequisite for determining the probable role of these receptors *in vivo* (Gunthorpe et al. (2002). TRENDS in Pharmacological Sciences). Furthermore, while the Specification of the Instant Application discloses that the VANILREP4 polypeptide of SEQ ID NO:2 displays some sequence and structural homology to

the rat vanilloid receptor VR1, it is noted that the results presented in Example 2 demonstrate that, in contrast to hVR1, hVR4 is not activated by RTX or capsaicin, which are known agonists of the VR1 vanilloid receptor.

17. Thus, although the homology of the vanilloid receptor family of ion channels, especially in the 6 transmembrane domain region, allows identification of such as vanilloid receptors, such is not predictive of function. Utility must be in readily available form. It is possible that, after further characterization, this protein might be found to have a patentable utility, in which case the protein would have a specific utility, or the protein might be found to be associated with a specific disease or disorder. This further characterization, however, is part of the act of the invention, and until it has been undertaken, Applicant's claimed invention is incomplete. Furthermore, whereas one could readily employ the putative VANILREP4 protein of the instant invention in an assay to identify modulators thereof, the information obtained from such assays would be of little use until one discovers the identity of those physiological processes mediated by that putative VANILREP4 protein. Because the instant specification has failed to identify a physiological process which has been shown to be influenced by the activation or inhibition of the putative VANILREP4 protein of the instant invention, an artisan would have no way of predicting what effects the administration of that modulator to an organism would have. If one cannot predict the effects that the administration of a modulator of the VANILREP4 protein of the instant invention is going to have on an organism, then it is unclear as to what practical or real world benefit is derived by the public from the identification of that modulator.

18. It is possible that, after further characterization, the putative VANILREP4 protein may be found to have a specific and substantial credible utility. This further characterization, however,

is part of the act of invention, and until it has been undertaken, Applicant's claimed invention is incomplete. The instant situation is directly analogous to that which was addressed in *Brenner v. Manson*, 148 U.S.P.Q. 689 (Sup. Ct, 1966), in which a novel compound which was structurally analogous to other compounds which were known to possess anti-cancer activity was alleged to be potentially useful as an anti-tumor agent in the absence of evidence supporting this utility. The court expressed the opinion that all chemical compounds are "useful" to the chemical arts when this term is given its broadest interpretation. However, the court held that this broad interpretation was not the intended definition of "useful" as it appears in 35 U.S.C. §101, which requires that an invention must have either an immediately obvious or fully disclosed "real world" utility. The court held that:

> "The basic quid pro quo contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility", "[u]nless and until a process is refined and developed to this point-where specific benefit exists in currently available form-there is insufficient justification for permitting an applicant to engross what may prove to be a broad field", and "a patent is not a hunting license", "[i]t is not a reward for the search, but compensation for its successful conclusion."

In the Instant case, the instant specification leaves it to the practitioner to discover the identity of a disease or disorder in which the claimed VANILREP4 protein of the instant invention is associated, or which mutated or aberrantly expressed; and then to discover the nature of that aberrant expression (i.e., overexpression or underexpression). The evidence of mere identification as a vanilloid receptor based on sequence homology is not tantamount to a showing of a role of the claimed polypeptide of SEQ ID NO:2 in the diagnosis of a disease/disorder, or that compounds that modulate its activity are useful in the treatment of a disease or disorder. Therefore, the claimed polynucleotide or the protein encoded thereby cannot be used in a

diagnostic or therapeutic capacity without the need for a substantial inventive contribution. Such additional experimentation, if needed to identify a specific utility for an invention, is precluded by the court.

19. Claims 3 and 4 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to make/use the claimed invention.

Summary

20. No claim is allowed.

Advisory Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Jon M. Lockard, Ph.D.** whose telephone number is **(571) 272-2717**. The examiner can normally be reached on Monday through Friday, 7:00 AM to 4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Brenda Brumback**, can be reached on **(571) 272-0961**.

The fax number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see **http://pair-direct.uspto.gov**. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

Jon M. Lockard, Ph.D.
February 15, 2007

CHRISTINE J. SAOUD
PRIMARY EXAMINER
Christine J. Saoud